

MEMORANDUM FOR: Conrad Lautenbacher, Jr.
Vice Admiral, U.S. Navy (Ret.)
Under Secretary of Commerce for
Oceans and Atmosphere

FROM: John J. Kelly, Jr.

SUBJECT: Followup to Program Review Team Recommendations from
NWS Employees

Attached are the National Weather Service's (NWS) responses to the 45 NWS employee recommendations to the Program Review Team. Each response describes the current status and, where appropriate, actions taken or planned. All responses will be shared with NWS employees through *NWS Focus*.

Attachment

1. The National Center for Environmental Prediction needs to be relocated to a modern, more spacious facility and adequately funded, both in terms of funding the people and the infrastructure (computers, communications, and such).

Response - I agree. In FY 2000, NOAA's National Weather Service (NWS), NOAA's National Environmental Satellite, Data and Information Service (NESDIS), the NOAA Facilities Office and the Government Services Administration (GSA) initiated the process to secure a new state-of-the-art 268,000 square foot facility. This facility is planned to house the National Centers for Environmental Prediction (NCEP), NESDIS research and operations units, and the Air Resource Laboratory (ARL). In FY 2002, Congress appropriated funds to GSA to prepare plans and to acquire land rights in the Maryland suburbs. The FY 2004 President's Budget contains \$10.4M to award a facility construction design/build contract to be managed by GSA and fully fund above standard construction costs. The timetable calls for occupancy in 2008, contingent to future adequate funding from Congress.

2. Improve Capability for Long Range Forecasting for Precipitation and Hydrological Conditions. Significantly strengthen resources for more accurate and longer range forecasting of precipitation patterns in the United States and the world. NOAA and its NWS should be focusing on having the capability for improved forecasting for the "quantity" part of the equation.

Response - I agree. NWS's Science and Technology Infusion Plan (STIP) incorporates the vision to provide, on a more frequent basis at more locations, accurate, graphically-based probabilistic forecasts and warnings of water excesses and deficits. The STIP objective is to provide long term water information, including unbiased, reliable quantitative precipitation estimates (QPE) in concert with model produced long-term quantitative precipitation forecasts (QPF). Potential solutions include advanced algorithms for QPE fed by improved dual polarization radars and satellite based data and information. Improved regional higher resolution models are targeted to provide enhanced QPF with resulting positive impacts on hydrometeorological forecasts and warnings.

3. There should be a major focal point for winter weather forecasting and research in the NWS. Hurricanes are serviced operationally by the Tropical Prediction Center and research wise by the Hurricane Research Division. Severe weather is serviced operationally by the Storm Prediction Center and research wise by the National Severe Storms Laboratory. Yet, the economic impact of winter weather far exceeds that of these other weather systems. Nearly everywhere in the country experiences a threat from hazardous winter weather each year. Yet, NOAA does not concentrate on this area, and its weather service is not organized to deal with this type of weather.

Response - I agree with the need to focus on winter weather. To accomplish this objective, NWS has been conducting a Winter Weather Experiment to improve winter storm watches and warnings. The Winter Weather Experiment, first conducted during the 2001-2002 winter season, involves the Hydrometeorological Prediction Center (HPC) of NCEP and 32 Eastern and

Central Region WFOs. HPC staffs two ten hour shifts per day and produces information tailored to forecasting winter weather that exceeds watch and warning criteria. Collaborative “chat” sessions enable all affected offices to discuss specific weather situations.

HPC and participating WFOs have found the collaborative process to be positive and believe that an existing National Center monitoring winter weather can serve as the point-of-contact to provide improved guidance, build consensus among impacted offices, and provide a more consistent and accurate product for the public. The process has been successful, as demonstrated by the 2003 President’s Day storm on the East Coast. Evaluation of the Winter Weather Experiment is planned by the end of FY 03; subject to the evaluation, the techniques are expected to be applied nationwide, with a fully coordinated suite of winter weather products. In addition, NWS’ Science and Technology Infusion Plan (STIP) includes a Winter Weather plan. It includes 5 and 10-year warning/forecast performance targets, identifies how to fill key information gaps and identifies outstanding R&D needs.

4. Improvement is needed in the prediction of winter storms.

Response - In addition to the Winter Weather Experiment discussed in recommendation 3, the NWS has recently implemented upgrades to numerical weather prediction models to improve forecasts of precipitation type and amount, as well as better define the rain/snow line. The Winter Storms Reconnaissance Program is designed to provide targeted observations to improve the lead times of winter storms. The Winter Storm Reconnaissance Program includes the NOAA G-IV flights over the east-central Pacific and Weather Reconnaissance Squadron (53rd WRS Air Force Reserve) WC-130s flights over the Gulf of Mexico, western North Atlantic, and east-central Pacific.

5. Restructure the role of NWS regions and headquarters. NWS has six regional offices; however, most of their functions are not management/leadership tasks that support the Weather Forecast Offices/River Forecast Centers. Over ½ of regional personnel do secondary support functions regarding Operations. Centralize non-direct management functions to NWS headquarters (Move the 30-50 percent affected personnel to HQ.) Increase the Regions' ability to support the management needs of WFOs/RFCs. (Transfer 10-25 percent personnel).

Response - I believe that National and Regional and Headquarters offices are structured appropriately to lead, plan and manage NWS resources and to provide a reasonable span of control for NWS senior management. (In the absence of a regional structure, over 135 field offices would report directly to me or my designee).

In FY 2000 NWS realigned Headquarters personnel to more appropriately reflect responsibilities and functions and to focus on policy vs. operating functions in National Headquarters. In 1997 the *NOAA Review* of NWS (the “Kelly Report”) concluded that the 6 Region structure was optimal for NWS to effectively manage field operations and maintain a reasonable span of control. The “Kelly Report” also recommended reducing in reduced staffs at regional

headquarters by 30% compared to 10 years ago. In addition, the NWS modernization enabled us to flatten our management structure to one management layer between the front line mission delivery offices and the NWS Director (Meteorologist or Hydrologist-In-Charge reports to the Regional Director who reports to the NWS Director).

By placing leadership, management, planning and support activities in Regional Headquarters, staff in service offices can provide maximum attention to providing day to day climate, water and weather services necessary to accomplish the NWS mission. The NWS Regional Headquarters structure puts government decision makers closer to the partners and customers who are using our services while maintaining cost effective use of personnel resources.

6. Enhance the capability of NWS River Forecast Centers (RFC) to meet the Nation's changing demands for a "New Economy of Water." Change the RFCs to River Forecast and Water Management Centers to reflect the changing needs of the U.S. Enhance RFC capabilities, visibility, partnerships, and research and development capability. NWS RFCs can play a lead role in water management decisions by assisting key users in making efficient decisions.

Response - I agree with the ever-growing significance of NOAA's hydrologic and water resources mission. That significance is reflected in both the NOAA and the NWS strategic plans. For FY 2003, NWS received \$6.1 million for Advanced Hydrologic Prediction Service (AHPS) and the President's Budget for FY 2004 includes a comparable amount. Full deployment of AHPS will provide RFC's with the enhanced science and operational infrastructure to support critical water management decisions. The deployment of AHPS will be accompanied by additional computing power to run new hydrologic models and forecasting tools.

Future budget initiative teams will treat water resources as a cross cutting theme to stimulate research, development, and operational implementation activities. This will enable us to deliver a robust spectrum of water resource services for domestic drinking water, agriculture, aquatic ecosystem health, recreation, industrial use, transportation, and power generation.

7. Resources to meet mission requirements, based on a ratio of staff to required services, are inadequate at the Southeast River Forecast Center (SERFC). There is a pressing need for an outreach hydrometeorologist position, similar to the NWS Warning Coordination Meteorologist (WCM) position at each RFC.

Response - I do not agree that NWS needs this additional position. In September 2001, NWS formed a River Forecast Center Operations Team to develop a vision for an optimal use of NWS resources to meet hydrologic service needs of partners and customers. This team's final report includes proposals to improve the technical capability of the hydrologic service, promote better understanding of RFC and WFO water service responsibilities, and enhance hydrologic training efforts for WFOs, RFCs, and NWS partners and customers. The team also indicated the current operational structure for the RFC effectively meets the needs of NWS customers, and does not

recommend any substantial modifications to WFO and RFC responsibilities, or the associated staffing.

8. The NWS can accomplish the President's FY 2003 Budget goals of eliminating excess organizational layers and redirecting staff from supervisory and overhead positions to line functions, while at the same time mitigating the effects of static or decreased funding, by eliminating the regional headquarters structure and by reallocating full time employees to both the local and national levels.

Response - I do not believe that NWS has excess management layers. As noted in the response to recommendation 5, the NWS modernization enabled us to flatten our management structure so that today there is only one management layer between the front line mission delivery offices and the NWS Director. Further, eliminating Regional Headquarters and reallocating staff will not eliminate necessary leadership, planning, management and operations functions nor save money. However, such elimination would create an unacceptable span of control for senior management.

9. Reduce the number of NWS Regional Headquarters from six to three by consolidating the U.S. into three geographically equal regions: Eastern, Central, and Western (which would include the Alaskan and Pacific areas). Either increase the staff of the remaining three regional headquarters or reassign staff to field offices that are currently understaffed. The NWS has too many managers and too few field staff to complete its mission.

Response - I do not agree that NWS has too many managers. As noted in recommendation 13, NWS has a supervisor to employee ratio of 1 to 9.85, which is above the overall NOAA ratio. Further, as noted in the response to recommendation 8, eliminating Regional Headquarters and reallocating staff will not eliminate management functions nor save money. However, it would create an unacceptable span of control for senior management.

10. Continue with the Original Modernization Plans that were implemented in the early 90's and reduce the number of NWS Regional Headquarters. Reducing Regional Headquarters and moving these full time positions to the field offices will improve the staffing levels at offices that are undermanned and, most important, would improve morale.

Response - Certainly staffing and employee morale are critical. However, reducing the number of Regional Headquarters and reallocating staff will not eliminate necessary leadership, planning, management and operations functions nor save money. However, it would create an unacceptable span of control for senior management.

11. Eliminate all the NWS regional headquarters to generate budget savings, faster decision making, consistent operations in the field, and better internet security.

Response - Budget savings, faster decision making, consistent operations in the field, and better internet security are worthwhile goals. We seek all staff input on how to achieve these goals. However, eliminating regional headquarters will not help. Changing the regional structures does

not eliminate the leadership, planning, management and operational needs currently performed by the regions; it merely moves it to another level. Eliminating the regional structures could, in fact, result in slower decision making as the span of control increases.

12. Increase NWS headquarters and research office personnel and budgets (e.g., NOAA's Forecast System Laboratory and NWS's Office of Science and Technology). Decrease NWS Regional personnel by reducing the number of NWS Regions from 6 to 3, by letting Western absorb Alaska and Pacific, and Central absorb Southern. I would further limit the functions of the regions to basic personnel and facilities management, and revert their scientific functions to headquarters. [This recommendation was also sent to the Office of Oceanic and Atmospheric Research.]

Response (coordinated with OAR) - Budgets for research are established by close cooperation between the Line Offices to maintain the proper balance of headquarters and field resources (within funds made available from Congress) and to support continued product and service excellence and operational efficiency. In addition to NWS headquarters and research personnel, NWS has an active and effective Science and Operations Officer (SOO) program exploiting the talent and dedication of field personnel who deal closely with NWS customers. The SOO serves as the senior science advisor in the field offices fully responsible for initiating, planning, coordinating and overseeing the transfer of new and emerging scientific technologies and techniques from research to operations. The Office of Science and Technology is working closely with the SOO's to provide an effective and efficient conduit for research ideas from the field to provide benefit across national programs. The diversity within the SOO program provides a robust capability to the NWS to ensure new and innovative science and technology concepts and capabilities are continually provided for NWS and NOAA corporate application.

As noted in response to several other recommendations, reducing the number of NWS Regions will not provide additional funds, but will cause other management issues.

13. We have too many managers in the NWS. With less than 5000 employees, how can the NWS justify six regional headquarters? Each region acts as its own separate NWS – thus we have six different Weather Services rather than ONE National Weather Service. The NWS has about 2000 Hydrometeorological Technicians and Meteorologists with around 800 managers. On average, there are 2.5 workers per manager. That is way too many managers!

Response - The NWS supervisor to employee ratio for NWS is 1 to 9.85, which is higher than the NOAA-wide supervisor to employee ratio of 1 to 9.2. As of December 14, 2002, NWS employed 450 supervisors and 4432 non-supervisors. For most of the Regions, the ratio is even higher.

I also agree that we must act as one NWS. We can accomplish this objective with Regional Headquarters managing day-to-day operations following policy established by NWS National Headquarters.

14. Technology is not necessarily decreasing the need for human resources; in fact, composing a forecast with the new system takes LONGER. Increase the staffing of field offices.

Response - From a budget perspective, it is unlikely that additional funds will be provided to increase staffing.

Improved use of technology enables us to leverage the capabilities of our staff. As noted in the response to recommendation 36, experience with the Interactive Forecast Preparation System (IFPS) enables us to improve effectiveness and efficiency. In addition, senior NWS personnel are examining the functions and structure of the Weather Forecast Office (WFO) of the future. As part of this initiative, I solicited input from the field as to what they think the fundamental functions of the WFO will be five to ten years from now. We also initiated the “ASK WHY?” program to provide the opportunity for staff to identify opportunities to reduce effort. Further, the Workforce/Human Capital Committee is examining solutions to the problem of limited or no applicants for GS-12 forecaster positions at several offices. We are also developing and implementing a Science and Technology Implementation Plan (STIP) to improve the capabilities of field forecasters through better use of technology and are constantly striving to upgrade NWS training so that field personnel are better able to use the capabilities available in the field.

15. Need additional personnel in field offices of NWS. Consider a redistribution of FTEs from headquarters (HQ) and from regional offices to the field.

Response - Similar to the previous response, we must seek opportunities within our funding to improve effectiveness and efficiency. Redistributing FTEs from HQ and from regional offices to the field does not reduce workload, it merely changes the location at which it is performed, perhaps less effectively. We are constantly seeking suggestions for improving operations and being able to leverage the capabilities of our staff so that we can make the best use of the resources that are available to us.

16. A growing number of contract personnel at NWS HQ masks the increase in staffing at HQ (since there are no new FTEs). Any HQ resources that can be freed up should be reprogrammed to the field.

Response - I am not aware of data that supports this view. Since 2001, the number of contract personnel in headquarters has remained constant (from 695 in 2001 to 688 in 2003). We strive to use resources provided to us most effectively, balancing the needs of the field with those of Headquarters organizations. At times this results in the use of contract personnel, to support the efforts of the government workforce.

17. At the local NWS office, the managers, especially the Meteorologist In Charge (MIC), do not work shifts. These are the same people who make policy for the NWS. How can you make policy if you do not know the workload? We are not being efficient as long as not everyone in the office shares the load and works shifts.

Response - In accordance with NWS policy, each Meteorologists In Charge (MIC), Science Operations Officer (SOO) and Warning Coordination Meteorologist (WCM) should work shifts so that they are operationally and technically capable of carrying out forecast and warning duties at the Weather Forecast Offices.

My data indicates that the policy is being carried out. A recent survey of the NWS regions indicates that over the past year MIC's spent, on average, 15% of their time working operational shifts, WCMs spent 25% of their time on shift, and SOO's spent 26% of their time on shift. If specific individuals are not working shifts, this matter should be discussed with the Office MIC.

18. *Make it a requirement for all of the local management (MIC, WCM, Science Operation Officer and Data Acquisition Program Manager) at NWS offices to work a certain percentage of operational shifts.*

Response - As noted, over the past year MIC's spent, on average, 15% of their time working operational shifts, WCM's spent 25% of their time on shift, and SOO's spent 26% of their time on shift. The Data Acquisition Program Manager does not have a shift work requirement.

19. *Make it easier to release employees – only in cases of just cause – in their first three years. We have too many employees that are not well adapted to the types of work that NWS does but who end up staying for their whole career.*

Response - Federal personnel regulations already include several provisions for new employees: a one-year probationary period followed by an additional two years of career conditional status. Further, available evidence does not support the assertion that we have "too many employees not well adapted to the type of work that NWS does." Performance appraisal data from fiscal year 2002 indicate that only 6 NWS employees (slightly over 0.1%) for whom performance appraisals were performed received a performance rating of "below expectations".

20. *Require headquarters to show a much stronger interest in the welfare of the rank-and-file forecasters with regard to quality of life (shift rotations, etc). For example, in my entire career I have never seen any attempt by headquarters to improve shift-rotation policies.*

Response - I agree. The NWS National Labor Council has organized a team of 8 personnel (with equal representation from management and the NWS Employees Organization) to identify and articulate the challenges as well as positive and negative affects of NWS employees working rotating shifts. The work group will provide recommendations (by Summer 2003) to remedy any specific problems identified in their analysis.

21. *Fund Environmental Compliance and Safety (ECS). A past NWS administration identified the need, but did not allocate the resources. Benefits would include compliance with Environmental Protection Agency (EPA) and Occupational Safety and Health Administration (OSHA) regulations before an accident or incident occurs, rather than after the fact.*

Response - I agree. In FY 2002, the NWS Corporate Board diverted funds from other uses for field office equipment and widespread environmental and safety training. Similar initiatives are planned for FY03 and FY04. Environmental and safety initiatives continue to be a high priority, ensuring the health and safety of NOAA employees. Employee safety is also a major concern of the Deputy Secretary of Commerce and NOAA's Undersecretary, adding emphasis to the NWS focus.

22. NWS should implement EPA and OSHA regulations, NWS Engineering Handbook 15, and soon-to-be released Engineering Handbook 16. NWS should fund statutory required programs consistent with industry and government practice (National Aeronautic and Space Administration (NASA), Federal Aviation Administration, Department of Defense, etc.). Hire an outside auditor/consultant to review proposals made to NWS management if necessary.

Response - I agree; NWS is implementing EPA and OSHA regulations through safety manual NWSM-50-1115 (Engineering Handbook 15) and environmental manual NWSM-50-5116 (Engineering Handbook 16). Using input from the regions, these manuals have been written to address specific OSHA and EPA regulations applicable to NOAA's National Weather Service operations. Extensive training has been and continues to be provided to safety and environmental focal points to aid in the education of employees. To expand safety education and training, during FY 2003 NWS managers and supervisors will take additional safety training provided by DuPont Safety Resources. Further, safety focal points and other managers will be required to attend the Stop Taking Avoidable Risks (STAR) Course in FY03. Additionally, web based safety training will be provided to all NOAA employees. NWS continues to fund required OSHA and EPA programs consistent with other Federal Agencies. I do not believe that an outside auditor or consultant would assist in improving our implementation of EPA and OSHA regulations.

23. NWS needs additional human resources in the form of Environmental or Safety professionals and clerical support to implement a large scale program from scratch. These could be contract personnel , but such personnel are not available at present. Environmental Compliance and Safety (EC&S) can be implemented faster and more efficiently with more than one employee now operating in a collateral duty assignment. Also, those who may someday be required to manage at the NWS Region level may not be environmental or safety professionals.

Response - In an effort to maximize available resources, NWS has chosen to implement the environmental and safety regulations using a mix of both government and contract personnel. Environmental and safety focal points have been identified at each field, regional and national headquarters office to support this implementation. Environmental and safety focal points are provided training on program requirements and the methods and tools required to implement the programs. Regions have also hired contract personnel to assist with the implementation of the environmental and safety programs. Based on feedback received from the regions, the implementation using a "team approach" at each facility has been successful. Safety is

everyone's business; we can each share the responsibility to apply and use safe practices in daily operations.

24. NWS field offices are inadequately staffed, and this problem is not offset by technological advancement. The field offices need approximately 100 full time employees (FTEs).

Response - The budget realities preclude us from hiring additional staff. Thus, it is critical that we take advantage of technology, enhance our training and continue to examine our concept of operations, among other activities, to leverage the capabilities of our staff. I continue to welcome suggestions by all staff to enable us to perform our mission more effectively and efficiently. Thus, I support the "WFO of the Future" initiative, the "ASK WHY?" program, the Workforce/Human Capital Committee activities and all other initiatives directed to fulfilling this goal.

25. NWS needs approximately 50 FTEs for fire forecasting, or else it needs to eliminate the program.

Response - As noted in several responses, we cannot change the realities of the budget. Our best approach is to utilize technology (e.g., IFPS), training and changes in operational concepts (such as the internet based "spot" forecasts) to improve the fire forecast capabilities. We cannot eliminate our fire forecast responsibilities. We must strive to improve our capabilities by working "smarter" to meet customer needs. We just trained all 63 Incident Meteorologists (IMETs) in the use of the All-Hands Meteorological Response System that will allow IMETs to receive info at fireside by satellite communication.

26. Replace retiring NWS cooperative observers with automated, telemetered systems.

Response - I agree with the need for more automated, telemetered systems as part of the COOP program. Thus, COOP modernization is underway to replace obsolete equipment, determine the optimum network size, and provide near-real time data monitoring and dissemination capabilities. The modernized COOP Network will be a human/machine hybrid providing the nation with an integrated surface hydrometeorological monitoring network with unprecedented real-time monitoring of weather and climate conditions. This initiative is consistent with the 1998 National Research Council report that stated that the NWS Cooperative Observer (COOP) Network, "... is an important component of the NWS data collection and is a vital component to the national observing capability..." and "... is an exceptional value in terms of benefits to the nation." COOP volunteers continue to provide these vital services as part of a modernized COOP program.

27. NWS needs a top-to-bottom review of FTE allocation for its forecasting.

Response - As noted in response to several recommendations, we must operate within the realities of the present federal budget climate. However, we are examining the operational

concept of NWS to determine if there is a more effective way to provide our services to the public. That examination – the WFO of the Future project – is considering input received from WFO staff, customers and stakeholders as well as review of future directions of science and technology and the needs of the Nation. That examination will enable NWS to review, and perhaps change, staffing for forecast services.

28. Elimination of NWS Cooperative program manager for each state causing problems. I suggest contracting for one person full time or recreate full time Cooperative manager for each state.

Response - In our efforts to use resources most effectively, the COOP management function was assigned to WFOs and the workload distributed among the HMT unit. Each WFO is responsible for managing the COOP program in accordance with overall NWS policies and standards.

29. NWS does not make effective use of many potential recruitment, retainment, student loan repayments and relocation benefits to hire and keep quality employees.

Response - NWS uses recruitment, retention, and relocation bonuses and other recruitment tools as necessary. With the exception of GS-12 forecasters in several locations, NWS has not had difficulty recruiting employees. Each year, colleges and universities with atmospheric science programs produce many more graduates than there are openings in NWS. Other than retirements, the employee departure rate in NWS has averaged 2.2% for the past four years. Counting retirements, the departure rate over the same period has averaged 4.3%. While these rates are low, NWS is interested in why employees leave and has implemented an exit interview program.

30. There is an imbalance between resources and requirements in NWS; it needs more resources. For example, a conflict between fire weather responsibility and aviation responsibility exists.

Response - We cannot change the realities of the budget. It is unlikely that we will receive additional resources to hire additional staff. I am not aware of the “conflict between fire weather responsibility and aviation responsibility” unless the reference is to the conflicts for time to provide all of our services. Our best approach to alleviating any conflict is to utilize technology (e.g., IFPS), as well as training and changes in operational concepts to improve both aviation and fire forecast capabilities. We must strive to improve our capabilities by working “smarter” to meet customer needs.

31. Meaningful NWS training remains an unmet goal. Consider consolidating forecaster education programs and eliminating the training branch.

Response - NWS invests significant resources in staff training; thus we have recently implemented the Weather Event Simulator and have developed and are presenting new courses, such as Leadership Training. In 2000, NWS training functions were consolidated with the

creation of the Training Division in the Office of Climate, Water, and Weather Services (OCWWS). The Training Division is the primary, centralized means for integrating the wide variety of training for NWS staff. The Training Division works with regional focal points to develop an annual Implementation Plan (IP) for Education and Training, which consolidates all training activities to be delivered by the OCWWS Training Division. The annual IP along with all NWS training materials are found on the NWS Training web page at <http://www.nwstc.noaa.gov/nwstrn>.

32. Appropriate flexibility needs to be incorporated into the Advanced Weather Interactive Processing System (AWIPS) to allow coastal Weather Forecast Offices to receive NASA QuikSCAT satellite data.

Response - I recognize the importance of NASA QuikSCAT Scatterometer marine surface winds for marine forecasting at coastal WFOs. NWS, working with NESDIS, plans to incorporate the Scatterometer marine surface winds data from the NASA QuikSCAT satellite into AWIPS, with scheduled deployment in August 2004. This decision was based on a Western Region (WR) initiative (in August 2000) to send QuikSCAT data to all 24 WR WFOs and 3 RFCs. The data was obtained from NESDIS/ORA and processed at Western Region Headquarters to make it compatible with AWIPS. The data was then sent out to all WR WFOs and RFCs for ingest into the AWIPS database via the Local Data Acquisition and Dissemination (LDAD) subsystem. The data is displayable and can be integrated with other observations in the AWIPS database. The data has been cited numerous times by forecasters for having a positive impact on marine forecasts.

33. Partner with other agencies (Federal Emergency Management Agency, DOD) to create a new national radio warning system and study the possibility of sending emergency warnings through existing computer networks.

Response - NWS continues to partner with other agencies and is taking a leadership role in using NOAA Weather Radio to send emergency warnings through existing networks. The President's Budget for FY 2004 includes a NWS initiative to automate the civil emergency warning process, with the objective of reducing from 7 to 2 minutes the time to get such a warning "on the air."

NWS partners with many agencies and organizations to accomplish our emergency warning dissemination mission and responsibilities. We have worked with the National Telecommunications and Information Administration, the Federal Communications Commission, automobile and automobile radio manufacturers, and other radio and television manufacturers on various projects. For example, Thomson Multimedia, Inc., announced in January 2003 several new models of RCA home entertainment televisions with NOAA Weather Radio (NWR) integrated into the design, making all-hazards emergency alerts available to greater numbers of Americans in their family rooms.

NWS is an active participant in the Partnership for Public Warning (PPW), along with the Federal Emergency Management Agency (FEMA) and U.S. Geological Survey since 2001. PPW helps establish realistic goals for warning systems now and in the future, defining a standard all-hazard terminology, creating standards for warning message content and format, examining and developing options to bring warnings to people at risk, and fostering a business environment for consumer warning systems.

34. Ensure preventive maintenance and calibrations are being performed on NWS systems.

Response - I agree. NWS Directives System, 30-21, Systems Maintenance, provides specific procedures for the equipment maintenance schedules. An example is NWS Instruction 30-2111, ASOS Maintenance. The document establishes the requirement for ASOS maintenance and the requirement for maintenance reporting in accordance with Maintenance Data Documentation (NWS Instruction 30-2104) Engineering Management Reporting System. These instructions apply to NWS field personnel maintaining ASOS sites sponsored by both the NWS and the Federal Aviation Administration. Similar instructions apply for all NWS equipment.

35. The use of satellite data for numerical weather prediction should be increased.

Response - I agree. Satellite data can fill data voids and add detail to forecasts. During the last decade, use of satellite data in operational prediction models has increased from less than one million observations per day to greater than 100 million observations per day; this represents over 97% of all data used in the numerical weather prediction model system. In 2001, NOAA, NASA and the Department of Defense created the Joint Center for Satellite Data Assimilation (JCSDA) to accelerate the use of research and operational satellite data in operational numerical prediction models. Data from several research satellites were introduced into NCEP's operational models, including microwave imager precipitation estimates from SSM/I and TRMM, cloud liquid water amounts from SSM/I and AMSU, IR radiances from GOES-10 and surface winds from QuikSCAT. In October 2002 an upgrade to satellite processing allowed nearly all satellite data of meteorological value to be processed. At the same time, the top level of NCEP's global model was raised to 0.2 mb allowing an additional stratospheric channel to be used in the model. Efforts in the coming year will include assessing data from the Atmospheric Infrared Sounder (AIRS).

36. The Interactive Forecast Preparation System (IFPS) is causing a reduction in efficiency and forecast accuracy because of lengthy graphical and matrix manipulations to a digital forecast database. Drop the use of the text generation portion of the program until it is better developed; just have forecasters make minimal graphical edits to generate forecasts.

Response - Increased use of technology will go a long way to alleviating workload pressures. We recognize the issues in the use of IFPS and are working with field and regional staff to address and correct the issues. As we gain experience with IFPS technology we are modifying operational capability to improve effectiveness, efficiency and forecast accuracy.

The NWS is entering a new era in providing service to the nation by providing digital forecasts. These forecast products are new and must be generated in new ways. Two methods are provided for doing this, a matrix editor and a graphical editor. Only the graphical editor needs to be used; the matrix portion can be used if desired. Forecasters can make only the amount of edits they believe necessary to portray the forecast. In addition we are developing "Smart Tools" to improve the forecaster's efficiency in grid editing, as well as text formatting software to automatically produce the text products from the digital products so forecasters can produce both the new digital products and old text products.

37. Better and higher capacity (memory) workstations and more qualified IT personnel are needed for the Climate Prediction Center and NCEP forecasters.

Response - NCEP's goal is to replace workstations on a three year cycle. Old workstations are continually being replaced by newer, more technologically advanced workstations. We believe that a three year replacement cycle represents an optimal interval to keep pace with the changes in technology and stay within the allocated budget.

38. NWS should utilize a piece of equipment that tests UPS batteries.

Response - I agree. NWS Regions are currently evaluating two different battery testers that can be used to identify deficient batteries. These testers will identify failed batteries and allow for individual battery removal, as compared to a wholesale removal of the entire battery suite. Contingent on the availability of regional funding, battery testers will be procured at Weather Forecast Offices in FY 04.

39. Insufficient Bandwidth is available for dissemination of new high resolution model and satellite data from the NWS Telecommunications Gateway (Telecommunications Operations Center, TOC) to NWS field offices. Obtain funding to support communications upgrade to significantly increase bandwidth and for additional Satellite Broadcast Network (SBN) channels.

Response - No question that we must be able to provide model and satellite data to field offices. The TOC/NCEP/NEXRAD Satellite Broadcast Network (SBN) T1 channel is experiencing saturation during peak usage periods due to increased demand for operational product to be delivered to WFOs. To alleviate this situation the Chief Information Officer (CIO) and the Office of Science and Technology (OS&T) have developed both a short term and a long term strategy to increase bandwidth.

In the short term, we will compress certain GOES WEST imagery so that it will fit within a single SBN T1 channel. In addition, we will employ new Digital Video Broadcast Satellite (DVS-S) technology which will increase channel bandwidth from 1.544 Mbps to 2.048 Mbps. Data will also be reallocated between the SBN channels in order to optimize existing capacity.

This strategy will be implemented in FY 2005.

In the longer term, the CIO and OS&T have developed a strategy for complete replacement of receiver station demodulators at all SBN downlinks and the further deployment of DVB-S technology to create a single 7.168 Mbps satellite channel. This capability will be implemented between FY 2005 and FY 2009, assuming funds are available.

40. Merge the workstation development programs, AWIPS and the National Centers Advanced Weather Interactive Processing (NAWIPS) for operational support to the NWS field offices (w/OST)

Response - This merger is in process. In May 2002 AWIPS deployed Release 5.2.1 which incorporated the premiere pieces of the NAWIPS systems, NMAP and GEMPAK, into the baseline as AWIPS applications. These applications were provided as part of the baseline AWIPS system to the National Centers, OCONUS Weather Forecast Office sites, and selected River Forecast Centers to support specific needs for which they provided the most cost-effective solution. These packages are operationally supported on AWIPS similar to other AWIPS applications. AWIPS supports both baseline updates to these packages. Additional steps are being worked to further converge the two architectures; however, because of the size, complexity, and costs, this initiative will take several years. Opportunities for further merging will be examined as the AWIPS infrastructure evolves to provide sufficient architectural basis to more fully support National Center specific requirements.

41. Currently, there is a distinct “gap” between NOAA’s coastal services and NWS inland hydrologic services. Establish an experimental facility at the Southeast River Forecast Center (SERFC), or elsewhere, that brings together SERFC hydrologists and meteorologists and NOAA coastal and ocean experts to develop a seamless suite of NOAA products and services. Foster partnerships between the SERFC and the NOAA Coastal Service Center and other entities within NOAA’s ocean and coastal sectors. Possibly co-locate. [This recommendation has also been sent to the National Ocean Service.]

Response (Coordinated with NOS) - We are making progress in “closing the gap.” For the last several months, the NWS Office of Science and Technology (OS&T) has sponsored meetings with the Office of Climate, Water, and Weather Services (OCWWS), Office of Hydrologic Development, WFO Jacksonville, SERFC, and the National Ocean Service (NOS) to promote NOAA’s Coastal Storms Initiative. A primary focus is to ensure the integration of the NWS river forecasting system and storm surge models with NOS estuary modeling. Current plans and activities include a seamless inundation forecast mapping application to support the development of coastal flooding products. This will leverage the heritage of the Lower Mississippi RFC, which has been active in linking the NWS storm surge model with the river forecast system for many years. In addition, the OCWWS Hydrologic Services Division and NOS Coastal Services Center are leveraging resources to devise a new generation of geospatially referenced, graphical hydrologic forecast products for use by the emergency managers. The SERFC will be involved in the development and testing of these augmented capabilities.

42. Properly fund NOAA, particularly OAR weather and climate research, or else consider integrating NOAA into NASA or another agency more oriented to the sciences. Currently, NWS and OAR are competing rather than developing synergies. [This recommendation was also sent to OAR.]

Response (Coordinated with OAR) - The NOAA Line Offices, including NWS and OAR, are working together to align NOAA's research and development programs to meet current and future service requirements. NOAA is also working with other agencies such as NASA to leverage research and development activities to further common goals. This complex management challenge requires significant change. This change could provide additional funding to OAR labs; alternatively, it could result in a restructuring of research programs to best meet NOAA's mission needs. Fundamental initiatives being implemented could improve the budget situation for OAR labs: the Programming, Planning and Budgeting System (PPBS) which better aligns research to mission goals and ensures proper budget considerations; OAR stratification of research to directed research which has definable impacts on operations and direct funding link; and exploratory research which challenges operational linkage but is more opportunity based when each mission goal budget is allocated to exploratory R&D.

43. There is a duplication of efforts and competing systems between the Forecast Systems Laboratory and the Meteorological Development Laboratory in IFPS development; stop this competition. [This recommendation was also sent to OAR.]

Response (Coordinated with OAR) - Currently, there is no duplication of efforts or competing systems. Previously competing activities were merged in 1997 into the focus on the Interactive Forecast Preparation System (IFPS) Program. The IFPS is one of the major applications being developed and deployed by the AWIPS Program to support NWS field operations and leverage the capabilities of staff. At this time the effort of the two laboratories is a coordinated effort, managed by the AWIPS Program, to produce the operational version of IFPS. Each laboratory is responsible for a major subsystem of IFPS that must and do work together.

NWS's Office of Science and Technology is proceeding with a series of reviews of laboratory activities including MDL and in the future, FSL. These reviews will define laboratory activities necessary to meet the mission of the laboratory, define the strengths of the laboratory and align activities with agency mission requirements. This 'sorting out' process will provide a better understanding of the laboratory activities needed to effectively execute mission essential programs.

44. In the past, most of the activities on the prediction side of NOAA have revolved around weather. Climate missions, both for seasonal forecasting and for global change projections, have become more important to the Nation's economy, well being, and future and will be equally or more important than weather forecasts. The models being developed for global change studies are incorporating good 'chunks' of the physics required to address a broad range of environmental issues. [This recommendation was also sent to OAR.]

Response (Coordinated with OAR) - The NWS recognizes climate as an integral part of its future. NWS is currently developing a plan for regional and local climate services. The plan addresses stewardship of data to preserve the integrity of the climate record, training of region and field personnel in delivery of climate services, education and outreach to decision makers and users of regional and local climate products, and fostering collaborations with the climate community.

NOAA's Office of Oceanic and Atmospheric Research and NWS are working towards the implementation of a community based common modeling framework. This will facilitate the transition of technology between climate change, climate variability, and weather models, hence giving NOAA the capability in the future of addressing a broad range of environmental issues.

45. Study the budget history of weather research funding, address lack of funding. [This recommendation was also sent to OAR.]

Response (Coordinated with OAR) - The NOAA Strategic Plan includes pursuing "sound, state-of-the-art research" as a cross-cutting priority. At the same time NOAA is implementing a disciplined Planning, Programming, and Budgeting System (PPBS) to ensure the goals and objectives important to our nation are appropriately prioritized, funded and executed. Such funding includes new support for the United States Weather Research Program and other weather research initiatives. NOAA will continue to request research and development resources in future budgets and also seek leveraging opportunities with other agencies to support its weather prediction mission and strategic goals.